REMARKS

All the claims submitted for examination in this application have been rejected on substantive grounds. Applicants have amended their claims and respectfully submit that all the claims currently in this application are patentable over the rejection of record.

All the claims examined on the merits in this application, Claims 3-22, 40-45 and 57, stand rejected on substantive grounds, under 35 U.S.C. §103(a), as being unpatentable over Japanese Patent Publication 49-16929 to Shinozaki taken in view of U.S. Patent 5,139,795 to DuRoss.

The Official Action avers that the principal Shinozaki reference discloses a method of manufacture of granular or powdered xylite, which is another name for xylitol, in which an aqueous solution of xylite is concentrated, the concentrated solution is seeded with powdered xylite and the product is dried to obtain a crystalline powder. The Official Action argues that the claims of the present application differ from Shinozaki only insofar as the specific use of crystalline xylitol in food products is concerned.

The Official Action applies DuRoss for its disclosure of utilizing crystalline xylitol in chewing gums. The Official Action concludes that it would be obvious, to one of ordinary skill in the art, to use the Shinozaki xylitol product in a chewing gum as taught by DuRoss.

The Official Action implicitly admits that the recitation of microcrystalline xylitol particles, recited in some of the claims of the present application, is not deemed worthy of patentable distinction insofar as applicant attaches no criticality to particle size. Moreover, the Official Action avers that the particle size is not a patentable distinction insofar as the obtaining of the claimed particle size of the present application involves nothing more than mere optimization, within the skill of the art.

Applicants submit that the Shinozaki disclosure represents a mere improvement of the conventional melt crystallization process disclosed earlier by DuRoss. That crystallization process involves a xylitol melt composition containing as little water as possible. Indeed, the water concentration in the Shinozaki melt contains water at a concentration of less than about 15% (Page 4, lines 5-11).

The broadest claim of the present application, Claim 57, involves a process for crystallizing xylitol in which an aqueous solution of xylitol is present in a concentration of between about 30% and about 80% by weight. (Emphasis added). As such, the minimum water concentration of the xylitol-containing solution is 20% by weight, far above the maximum 15% by weight concentration of water in the Shinozaki melt composition.

This difference is emphasized in one of the instant amendments to Claim 57. In amended Claim 57 the contact of the aqueous solution of xylitol, in step (a), with gas suspended fine particles containing microcrystalline xylitol is limited to spraying. Support for this new limitation is provided in the originally filed specification at Page 3, lines 26-29. Indeed, this limitation originally appeared in Claim 4. It is noted in passing that Claim 4, which has been made redundant by this amendment to Claim 57, has been cancelled.

This amendment to Claim 1 emphasizes the clear line of distinction between the Shinozaki process and that employed in the claims of the present application. That is, in the present process spraying of the aqueous xylitol solution into gas suspended fine solid particles of microcrystalline xylitol results in the formation of suspended solid particles which act as seed crystals wherein microcrystals of xylitol form and agglomerate in random fashion. It is emphasized that, unlike the Shinozaki process, there is no contact between liquid and solid particles. Obviously, this is so because there can be no such contact in a gas suspended state.

It is only in this state that a suspended microcrystals can agglomerate in a random manner by collusions with each other. Such microcrystal formation cannot occur in the continuously stirred molten mass of xylitol in a vessel, as taught by Shinozaki.

This important distinction has been further emphasized in amended Claim 57 by adding a clarifying clause in step (b). That amended step recites that the substantial removal of water solvent from the aqueous solution occurs in the gas suspended state. Although this limitation is clearly implicit in the original recitation of Claim 57, the explicit mention of that fact further emphasizes the advance in the art provided by the process of the present application. Support for this newly added limitation is provided in the originally filed specification at Page 7, lines 19-24. Therein it is recited that wetted particles and any free droplets of xylitol solution need a drying gas, such as heated air, to provide removal of the solvent component of the liquid. The specification mentions that the drying gas is preferably air heated to a temperature of 55-170°C.

The clearly distinguished process of the present application is not made obvious by the combined teaching of Shinozaki and DuRoss. This is so insofar as several advantages are obtained in the process of the present application compared to that taught by the combined teaching of the applied references.

For one thing the process of the present application provides for the water solvent to be more rapidly and efficiently removed. The large exposed surfaces of the small spray droplets and the large exposed surfaces of the wetted solid particles, as those skilled in the heat transfer arts are aware, are rapidly removed. This rapid removal, in turn, speeds up the crystallization process.

An advantage related to the aforementioned advantage is that the process of the present invention, unlike the process taught by the combined teaching of Shinozaki and DuRoss, provides simultaneous evaporation, crystallization and drying in a fluidized state. Those skilled in the art appreciate that this enhances the speed, and thus the efficiency, of the overall process.

The earlier discussion of the claimed feed solution having a xylitol concentration of between about 30% and about 80% by weight, compared to a minimum xylitol concentration of above 85% in Shinozaki, further emphasizes the more rapid nature of the process of the present application compared to that of the combined teaching of the applied references.

A further advantage of the feed solution, as claimed in the process of the present application, over the Shinozaki feed solution containing at least 85% xylitol, is that the higher concentration Shinozaki feed solution causes spontaneous crystallization. That is, in a high xylitol concentration solution, such as that disclosed by Shinozaki, xylitol crystallization spontaneously begins even without the addition of seed crystals. The crystallization of xylitol results in rapid increase in viscosity requiring high torque apparatus to stir, mix and move this highly viscous mass. Such problems do not exist in the xylitol aqueous solution of the present process insofar as its maximum xylitol concentration of 80% xylitol by weight does not support spontaneous crystallization.

A further advantage of the xylitol product produced in the process of the present application, which is clearly distinguished from that of the combined teaching of Shinozaki and DuRoss, is that the xylitol product of the present process provides a particulate porous and light structure which granulates easily. As such, this product is easy to comminute into

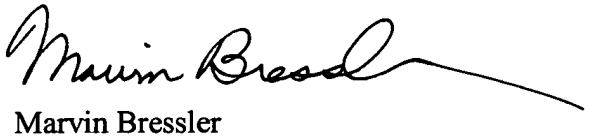
smaller particles with mild milling treatment. The processing of the xylitol granulated product of Shinozaki requires stronger milling treatment.

The aforementioned advantage yields yet a further advantage. Xylitol granules of the present invention have excellent handleability, flowability and compressability characteristics insofar as each particle is separately formed in air and is subsequently joined together to form a loosened porous structure. This advantage is of particular importance in the processing of xylitol into edible products, such as chewing gum.

The above amendments and remarks establish that the claims of the present application are not made obvious by the combined teaching of Shinozaki and DuRoss. Reconsideration and removal of this ground of rejection is therefore deemed appropriate. Such action is respectfully urged.

The above amendment and remarks establish the patentable nature of all the claims currently in this application. Notice of Allowance and passage to issue of these claims, Claims 3, 5-22, 40-45 and 57, is therefore respectfully solicited.

Respectfully submitted,



Marvin Bressler
Registration No. 25,132
Attorney for Applicants

Scully, Scott, Murphy & Presser
400 Garden City Plaza
Garden City, New York 11530
516-742-4343
MB:ml